CLAIMS

What is claimed is:

1. A method applicable within a mobile communication system for adaptively allocating a downlink data rate to an access terminal to compensate for channel fading, said method comprising:

selecting a downlink data rate in accordance with a determined signal-to-noise level, wherein said downlink data rate is associated with a specified signal-to-noise threshold to achieve a specified packet error rate;

transmitting a packet to an access terminal at said selected downlink data rate; and

responsive to successfully decoding said packet, decreasing the signal-to-noise threshold specified for said selected downlink data rate.

2. The method of claim 1, wherein said determined signal-to-noise level at said access terminal is a ratio of the signal strength of an allocated access terminal channel to the combined external signal strength.

3. The method of claim 1, wherein said selecting a downlink data rate is preceded by determining a signal-to-noise level at said access terminal.

4. The method of claim 1, wherein said selecting a downlink data rate further comprises:

comparing said determined signal-to-noise level with a plurality of signal-to-noise threshold values, wherein each of said plurality of signal-to-noise threshold values is associated with a downlink data rate; and

selecting a highest downlink data rate corresponding to one of said plurality of signal-to-noise threshold values that does not exceed said determined signal-to-noise level.

5. The method of claim 4, wherein said mobile communication system includes selectable data rate control sets in which each of said plurality of signal-to-noise threshold values is associated with a corresponding downlink data rate for said specified packet error rate, and wherein two or more of said plurality of signal-to-noise threshold values that do not exceed said determined signal-to-noise level are associated with said highest downlink data rate, said method further comprising:

comparing the relative values of said two or more signal-to-noise threshold values; and

selecting a data rate control set corresponding to the lowest among said two or more signal-to-noise threshold values.

6. The method of claim 1, further comprising:

responsive to unsuccessfully decoding said packet, increasing the signal-to-noise threshold specified for said selected downlink data rate.

7. The method of claim 6, wherein said increasing the signal-to-noise threshold specified for said selected downlink data rate comprises:

computing an increased signal-to-noise threshold specified for said selected downlink data rate in accordance with the relation:

$$T = T_j + \Delta_{local}$$

wherein T represents the increased signal-to-noise threshold associated with the selected downlink data rate, T_j represents the current signal-to-noise threshold value associated with the selected downlink data rate, and Δ_{local} represents a local data rate control delta value.

8. The method of claim 7, wherein said mobile communication system includes selectable data rate control sets in which each of said plurality of signal-to-noise threshold values is associated with a corresponding downlink data rate for said specified packet error rate, said method further comprising:

responsive to unsuccessfully decoding said packet, increasing each of said plurality of signal-to-noise threshold values in accordance with the relation:

$$T = T_i + \Delta_{global}$$

wherein T represents the increased value for the i^{th} signal-to-noise threshold value among said plurality of signal-to-noise threshold values, T_i represents current value for the i^{th} signal-to-noise threshold value among said plurality of signal-to-noise threshold values, PER represents said specified packet error rate, and Δ_{global} represents a global data rate control delta value.

9. The method of claim 1, wherein said decreasing the signal-to-noise threshold specified for said selected downlink data rate comprises:

computing a decreased signal-to-noise threshold specified for said selected downlink data rate in accordance with the relation:

$$T = T_j - (PER * \Delta_{local})$$

wherein T represents the decreased signal-to-noise threshold value associated with the selected downlink data rate, T_j represents the current signal-to-noise threshold value associated with the selected downlink data rate, *PER* represents said specified packet error rate, and Δ_{local} represents a local data rate control delta value.

10. The method of claim 9, wherein said mobile communication system includes selectable data rate control sets in which each of said plurality of signal-to-noise threshold values is associated with a corresponding downlink data rate for said specified packet error rate, said method further comprising:

responsive to successfully decoding said packet, decreasing each of said plurality of signal-to-noise threshold values in accordance with the relation:

$$T = T_i - (PER * \Delta_{global})$$

wherein T represents the decreased signal-to-noise threshold , T_i represents the i^{th} signal-to-noise threshold value among said plurality of signal-to-noise threshold values, *PER* represents said specified packet error rate, and Δ_{global} represents a global data rate control delta value.

11. A mobile communication system for adaptively allocating a downlink data rate to an access terminal to compensate for channel fading, said mobile communication system comprising:

processing means for selecting a downlink data rate in accordance with a determined signal-to-noise level, wherein said downlink data rate is associated with a specified signal-to-noise threshold to achieve a specified packet error rate;

air-interface transmission means for transmitting a packet to an access terminal at said selected downlink data rate; and

processing means responsive to successfully decoding said packet for decreasing the signal-to-noise threshold specified for said selected downlink data rate.

12. The mobile communication system of claim 11, wherein said determined signal-to-noise level at said access terminal is a ratio of the signal strength of a pilot channel to the combined external signal strength.

13. The mobile communication system of claim 11, further comprising signal detection and processing means for determining a signal-to-noise level at said access terminal.

14. The mobile communication system of claim 11, wherein said processing means for selecting a downlink data rate further comprises:

processing means for comparing said determined signal-to-noise level with a plurality of signal-to-noise threshold values, wherein each of said plurality of signal-to-noise threshold values is associated with a downlink data rate; and

processing means for selecting a highest downlink data rate corresponding to one of said plurality of signal-to-noise threshold values that does not exceed said determined signal-to-noise level.

15. The mobile communication system of claim 14, further comprising memory containing selectable data rate control sets in which each of said plurality of signal-to-noise threshold values is associated with a corresponding downlink data rate for said specified packet error rate, and wherein two or more of said plurality of signal-to-noise threshold values that do not exceed said determined signal-to-noise level are associated with said highest downlink data rate, said mobile communication system further comprising:

processing means for comparing the relative values of said two or more signal-to-noise threshold values; and

processing means for selecting a data rate control set corresponding to the lowest among said two or more signal-to-noise threshold values.

16. The mobile communication system of claim 11, further comprising:

processing means responsive to unsuccessfully decoding said packet for increasing the signal-to-noise threshold specified for said selected downlink data rate.

17. The mobile communication system of claim 16, wherein said processing means for increasing the signal-to-noise threshold specified for said selected downlink data rate comprises:

processing means for computing an increased signal-to-noise threshold specified for said selected downlink data rate in accordance with the relation:

$$T = T_j + \Delta_{local}$$

wherein T represents the increased signal-to-noise threshold associated with the selected downlink data rate, T_j represents the current signal-to-noise threshold value associated with the selected downlink data rate, and Δ_{local} represents a local data rate control delta value.

18. The mobile communication system of claim 17, further comprising memory containing selectable data rate control sets in which each of said plurality of signal-to-noise threshold values is associated with a corresponding downlink

data rate for said specified packet error rate, said mobile communication system further comprising:

processing means responsive to unsuccessfully decoding said packet for increasing each of said plurality of signal-to-noise threshold values in accordance with the relation:

$$T = T_i + \Delta_{global}$$

wherein T represents the increased value for the i^{th} signal-to-noise threshold value among said plurality of signal-to-noise threshold values, T_i represents current value for the i^{th} signal-to-noise threshold value among said plurality of signal-to-noise threshold values, PER represents said specified packet error rate, and Δ_{global} represents a global data rate control delta value.

19. The mobile communication system of claim 11, wherein said processing means for decreasing the signal-to-noise threshold specified for said selected downlink data rate comprises:

processing means for computing a decreased signal-to-noise threshold specified for said selected downlink data rate in accordance with the relation:

$$T = T_j - (PER * \Delta_{local})$$

wherein T represents the decreased signal-to-noise threshold value associated with the selected downlink data rate, T_j represents the current signal-to-noise threshold value associated with the selected downlink data rate, PER represents said specified packet error rate, and Δ_{local} represents a local data rate control delta value.

20. The mobile communication system of claim 19, further comprising memory for storing selectable data rate control sets in which each of said plurality

of signal-to-noise threshold values is associated with a corresponding downlink data rate for said specified packet error rate, said mobile communication system further comprising:

processing means responsive to successfully decoding said packet for decreasing each of said plurality of signal-to-noise threshold values in accordance with the relation:

$$T = T_j - (PER * \Delta_{local})$$

wherein T represents the decreased signal-to-noise threshold , T_i represents the i^{th} signal-to-noise threshold value among said plurality of signal-to-noise threshold values, PER represents said specified packet error rate, and Δ_{global} represents a global data rate control delta value.